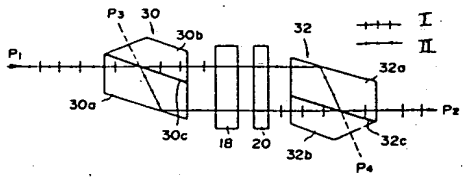
(54) **OPTICAL CIRCULATOR**
(11) **4-24608 (A)** (43) 28.1.1992 (19) JP
(21) Appl. No. 2-130023 (22) 19.5.1990
(71) FUJI ELELCTROCHEM CO LTD (72) TATSUYA NISHIMURA(1)
(51) **Int. Cl⁵. G02B27/28**

PURPOSE: To improve the crosstalk of the optical circulator by combining a crystal body having the shape of a parallelopiped and a crystal body having the shape of a trapezoidal prism through an air layer.

CONSTITUTION: Polarizing prisms 30 and 32 are composed of uniaxial monocrystal and have structure combining crystal bodies 30a and 32a, which have the shape of the parallelopiped forming the angle of polarization respectively between two opposed faces and light incident/emitting end faces, and crystal bodies 30b and 32b, which have the shape of the trapezoidal prism forming the angle of polarization to the light incident/emitting end faces, through air layers 30c and 32c. When a beam is made incident, an S polarized beam and a P polarized beam are almost completely splitted since only the S polarized beam is reflected on the plane of polarization. Afterwards, one beam is totally reflected on the surface of the prism and emitted parallelly. Therefore, by arranging a Faraday rotator 20 and a 1/2 wavelength plate 18 between the two polarizing prisms 30 and 32, the four port circulator is constituted. Thus, the crosstalk is improved.

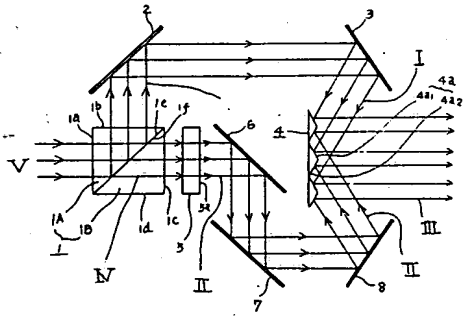


I: P polarized beam, II: S polarized beam

(54) **POLARIZATION TRANSFORMING OPTICAL SYSTEM**
(11) **4-24609 (A)** (43) 28.1.1992 (19) JP
(21) Appl. No. 2-129966 (22) 18.5.1990
(71) VICTOR CO OF JAPAN LTD (72) RYOYU TAKANASHI(2)
(51) **Int. Cl⁵. G02B27/28**

PURPOSE: To obtain a high illuminance characteristic having high efficiency for utilizing beams without varying the illuminance characteristic by emitting a linearly polarized beam composed of almost one series of S polarized beams or P polarized beams mixed and synthesized by plural mirrors.

CONSTITUTION: The first S polarized beam is reflected on the side of a mirror face $4a_1$ of a mirror face 4a and the second S polarized beam is reflected on the side of a mirror face $4a_2$. These first and second S polarized beams are mixed and synthesized so as to obtain the linearly polarized beam of almost one series of S polarized beams composed of parallel light flux. Since this third S polarized beam mixes and synthesizes the beams, it becomes the almost uniform linearly polarized beam. On the other hand, from indefinitely polarized beams from a light source, the linearly polarized beam of the mixed and synthesized S or P polarized beams composed of the parallel light flux is obtained by using a single polarized beam splitter 1 without using plural polarized beam splitters. Thus, the high illuminance characteristic having the high efficiency for utilizing beams can be obtained without varying the illuminance characteristic.

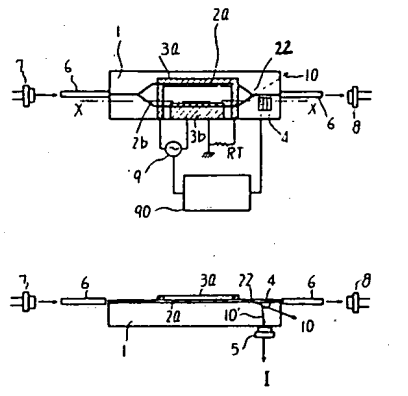


I-III: first-third S polarized beams, IV: first P polarized beam, V: indefinitely polarized beam

(54) **OPTICAL MODULATOR**
(11) **4-24610 (A)** (43) 28.1.1992 (19) JP
(21) Appl. No. 2-129751 (22) 18.5.1990
(71) FUJITSU LTD (72) TADAO NAKAZAWA(2)
(51) **Int. Cl⁵. G02F1/03**

PURPOSE: To shorten the transmission distance of an optical fiber by controlling the operating point of the optical modulator while changing a direct current bias to be impressed to an electrode corresponding to the change of an output electric signal photodetected and converted by a photodetector.

CONSTITUTION: When the operating point is deviated, a beam radiated from a joining point 22 of branched optical waveguides 2a and 2b is taken out as a monitor beam at the back of a substrate 1. The deviation of the operating point is detected by a photodetector 5 and a signal processing/control circuit part 90 and fed back to a power source 9, and the adjustment of the DC bias is executed to hold the correct operating point at all times. Thus, with extremely simple configuration, the transmission of the optical fiber is prevented from being shortened, without exerting any influence onto the optical power of a signal beam.



4: groove, 6: optical fiber, 10: radiated beam, I: to signal processing/control circuit part